Brachytherapy in localized prostate cancer with or without androgen deprivation

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Purpose. Our aim was to compare cancer control and toxicity outcomes of hormonal therapy added to combination of external beam radiotherapy (EBRT) and local high-dose-rate (HDR) brachytherapy boost in patients with unfavorable prostate cancer as opposed to patients with the same radiation treatment without hormonal therapy.
Methods and materials. From January 2007 to November 2008, 62 patients with intermediate and high risk localized prostate cancer were enrolled in a randomized clinical trial. – First group received hormonal therapy added to combination of external beam radiotherapy (EBRT) and high-dose-rate (HDR) brachytherapy boost. – Second group received EBRT and HDR brachytherapy boost alone without hormonal therapy. The median follow-up was 60 months. Freedom from biochemical failure rates were calculated using the Phoenix definition. Toxicity was reported according to the Common Toxicity Criteria for Adverse Event, Version 4.0.
Results. No advantages in biochemical control could be detected between the patients receiving vs. not receiving hormonal therapy at 6 years with rates of 83% vs. 90%, respectively ($P = 0.4$). Freedom for distal metastases and locoregional control did not differ significantly between patients receiving hormonal treatment with EBRT and HDR brachytherapy and those treated with EBRT and HDR brachytherapy boost alone with rates of 87%. No significant difference was detected with respect to toxicity between patients treated with vs. without hormonal therapy.
Conclusions. Hormonal therapy given as adjuvant therapy with combined implantation and EBRT in patients with unfavorable prostate cancer failed to improve biochemical control in our study.

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Brachytherapy on T1–T2 penile cancer. Initial experience

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Introduction. Penile cancer is a radio-curable disease. Brachytherapy has been proven to be a valid option in the treatment of the primary tumor for penis-preserving strategy.
Material and methods. The treatment was based on our standardized high dose interstitial brachytherapy technique applied in our institution for breast carcinoma. Special care for urethra preservation was taken. The procedure was performed by the collaborative effort between urologists and radiotherapy oncologists. Previous to treatment, circumcision was performed and pelvic lymphnodes in the CT were not observed. We placed plastic vectors in two planes. A previous CT simulation and a previous dosimetric study was performed. The EQD2 administered was 45–50 Gy with 4 Gy and BID fractionation administered during one or two weeks.
Results. Two cases of <4 cm squamous cell carcinoma were treated. One patient was 55 years old (T1) and the other was 66 years old (T2). The follow-up was 14 and 10 months respectively. Tolerance to treatment was good. Salvage surgery was performed in both cases and tumor free margins were described by the pathology. Treatment toxicity was edema and mucositis G2. One patient had bulbar urethral stricture, apart from the tumor area, related with urethral catheterization. Both cases preserved sexual function and satisfaction with the treatment was excellent.
Conclusions. The high dose interstitial brachytherapy is a safe and effective treatment for selected patients with T1–T2 penile carcinoma and negative lymphnodes. Penis-preserving strategy is associated with higher quality of life.

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Brachytherapy with 125-I seeds for prostate carcinoma: Learning curve

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Introduction. Brachytherapy with 125-I seeds in selected patient's with prostate carcinoma has great results if covering D90 and V100 of prostate, as ESTRO recommendations. Objective To analyze results and learning curve at our institution on incorporation of brachytherapy with permanent implants of 125-I seeds in prostate carcinoma with real-time planification and Quick-Link system.

Methods. Between March of 2011 and December of 2012 were performed 41 prostate brachytherapy applications with permanent implants of 125-I seeds in patients diagnosed with prostate adenocarcinoma low and intermediate risk, as monotherapy or combined with EBRT. The patient's characteristics were: 87.8% had stage ≤ T2a, 9.8% stage T2b and 2.4% T2c. Mean PSA: 6.73 ng/ml (range 4.06–16.7). 87.8% were Gleason ≤ 6 and 7 (3 + 4) 12.2%. Median prostate volume was 33 cm^3, only one patient had volume 53.8 cm^3. System Quick-Link was used with real-time planification, inserting a median of 16 needles and 60 seeds (range 38–82) to cover PTV with 145 Gy isodose in cases of brachytherapy with radical intent (92.6%) and 108 Gy in the implants combined with EBRT (7.4%).
Results. We obtained a mean V100 PTV of 96.96% (between 92.1–99.8%), perceiving a learning curve of which 97.5% of cases (39/41) V100 was ≥95% as ESTRO recommendations. The total median D90 was 169.9 Gy in implants performed with radical intent (89.47%, >160 Gy, 34/38) and 123.5 Gy in combination with EBRT (100% >119 Gy), following ESTRO recommendations. At 3 months, we observed low levels in PSA in most of the cases.
Conclusion. The use of real-time planification and Quick-Link construction seed system in brachytherapy for prostate carcinoma, improves the learning curve of this technique. We achieved mean V100 and D90 with better compliance with the recommendations of ESTRO in most of the 41 patients treated with brachytherapy with this method of dosimetric calculation.

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Clinical dosimetric on 100 patients with HDR breast brachytherapy with plastic multi-catheters

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Objectives. To evaluate quality indexes in 3D-CT-based HDR breast brachytherapy and to compare between patients with partial irradiation and those with boost.
Material and methods. This is a prospective study on 100 patients from March 2008 to December 2012. In 15 (15%) patients received accelerated partial breast irradiation (APBI) and the remaining 85% had boost after external radiation therapy. Age was significantly lower in the boost group (49.79 ± 9.03 vs. 69.60 ± 6.68; $p = 0.0000000000002$). Tumor size was significantly bigger in the boost group (18.8 ± 10.31 vs. 12.8 ± 7.75 mm; $p = 0.03$) while the margin was similar in both groups. Data are shown as mean ± SD. The Student's *t* test was used for comparisons.
Results. Patients were planned using 2 planes in 2 cases of APBI (13.3%, 2/15) and in 35 cases of boost (41.2%) ($p = 0.04$). In the rest 3, planes were used. PTV, PTV90, DHI and VI-200 were significantly higher in patients receiving APBI than in those with boost. PTV: 83.13 ± 44.68 vs. 53.11 ± 27.10; $p = 0.02$); PTV90: 86.73 ± 12.80 vs. 72.36 ± 28.5; $p = 0.003$; for DHI: 78.33 ± 3.84 vs. 75.54 ± 4.92; $p = 0.04$ and 8.67 ± 3.73 vs. 6.56 ± 2.30; $p = 0.004$ for VI-200. The rest of the studied indexes were similar in both groups: VI-150; ΦV-200; COIN; Dmax skin. DHI in APBI was significant higher when using 3 planes vs. 2 planes 79.15 ± 3.21 vs. 73.00 ± 4.24; $p = 0.02$. There were no significant correlations between tumor size and any of the studied quality indexes.
Conclusions. Quality indexes in 3D-CT based HDR were within the recommended ranges for patient planning, although COIN was in the lower limit which should be improved. Quality indexes were better in the APBI group, especially when using 3 planes. These differences are not related to a larger tumor size but probably to a wider planning margin in patients with partial irradiation. No local recurrence.

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Clinical experience: Hyaluronic acid to prevent radiation cystitis, gynecological cancer

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Introduction/Objective. To evaluate if glycosaminoglycan's (GAG) administration as hyaluronic acid (HA) intravesical instillations reduces the rate of acute and later radioinduced bladder toxicity. A review of the literature was done.
Materials and methods. Retrospective study of 131 patients diagnosed with cervical and endometrial cancer treated between May 2010 and December 2012 with high-dose rate brachytherapy (HDR-BT) with or without external beam radiotherapy (EBRT). 93/131 received an EBRT total dose of 45–50.4 Gy delivered followed by brachytherapy (HDR-BT) 11 Gy in 2 fractions. The remaining 38 patients received HDR-BT alone, 21 Gy in 3 fractions. All of them received intravesical instillations of hyaluronic acid (HA) after each HDR-BT fraction. 9/93 (10%) presented G1-2 toxicity before brachytherapy. RTOG/EORTC scale was used to evaluate acute and late toxicity rates at 3, 6, and 12 months after HDR-BT. A review of the literature was made using Medline research with the following criteria: HA prevention and gynecological cancer and radioinduced cystitis.
Results. No upgrading toxicity was observed in patients treated with combined HDR-BT and EBRT (93/131) during the follow-up period. None of the patients (38/131) treated with exclusive HDR-BT had bladder toxicity. No adverse events related to HA were observed. HA instillations have demonstrated effectiveness in relieving symptoms associated with interstitial cystitis,